



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/767,925	01/23/2001	Kaius Kiiren Polikarpus	DP-300566	1447

7590 10/21/2003

VINCENT A. CICHOSZ
DELPHI TECHNOLOGIES, INC.
Legal Staff Mail Code: 480-414-420
P.O. Box 5052
Troy, MI 48007-5052

EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/767,925

Applicant(s)

POLIKARPUS ET AL.

Examiner

Kaj Olsen

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 and 36-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38-42 is/are allowed.
- 6) ☒ Claim(s) 1-32, 36, 37 and 43-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Double Patenting

1. Claim 43 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 36. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1, 4, 6-18, 20-22, 25-32, 36, 37, and 43-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al (USP 6,258,233) in view of Noda et al (US

Art Unit: 1753

2003/0006139 A1). Noda is a reference that is being cited for the first time with this office action.

5. With respect to claim 1, Sugiyama discloses a method of manufacturing a zirconia-alumina body that comprises mixing zirconia, yttria, and at least one solvent to form a mixture (col. 7, lines 48-56). Said mixture is dried (col. 7, line 60) and disposed adjacent to an unfired alumina body (13 and/or 16) and the zirconia and the alumina bodies are co-fired together (col. 8, lines 11-19 and lines 34-38). The zirconia utilized by Sugiyama comprises a percentage of monoclinic phase, as measured from the diffraction intensities, that varies between 5 and 25 % based on the total weight of zirconia (col. 2, lines 38-50).

6. Sugiyama does not explicitly suggest also including alumina to the zirconia mixture, Noda teaches in an alternate method for preparing zirconia for electrochemical sensors that adding alumina to the zirconia mixture allows one to better match the thermal expansion of the electrolyte to the other substrates thereby minimizing cracking (paragraphs 0006, 0007, and 0022). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Noda for the method of Sugiyama in order to minimize laminate cracking. With respect to the claimed level of silicon impurities, see claim 25 of Noda, which teaches the use of zirconia having less than 100 ppm of total impurities.

7. With respect to claims 4, 7, and 8, see Sugiyama, col. 7, lines 55-57.

8. With respect to claim 6, Sugiyama particularly teaches the use of compositions between 18 and 25 % monoclinic (fig. 13 and tables 1-3).

9. With respect to claim 9, although neither Sugiyama nor Noda specify a particular sintering mismatch, this would appear to the examiner to be a function of the percentage of

Art Unit: 1753

monoclinic zirconia utilized for the body (as taught by Sugiyama) and/or the addition of alumina to the mixture (as taught by Noda). Hence the method as set forth above would inherently produce a laminated mixture and alumina surface having the claimed mismatched. In addition, the teaching of Noda is drawn to the concept of minimizing the mismatch that results in cracking.

10. With respect to claims 10 and 11, see Sugiyama, col. 13, lines 19-22.

11. With respect to claim 12, see Sugiyama, col. 7, line 54.

12. With respect to claims 13 and 14, Sugiyama teaches the use of 6 mol% yttrium oxide (col. 7, lines 50 and 51) and Noda teaches the use of both 5 and 10% by weight of Al_2O_3 (paragraphs 0010 and 0011)

13. With respect to claim 15, see Sugiyama, col. 7, line 65 through col. 8, line 3.

14. With respect to claim 16 (those limitations not covered above for claim 1), Sugiyama teaches disposing an electrode onto each side of the unfired zirconia body and connecting each electrode to an electrical lead (col. 7, line 65 through col. 8, line 3).

15. With respect to claim 17, see paragraph 0099 of Noda.

16. With respect to claim 18, layers 16 and 22 would constitute support layers and a heater 25 is disposed within the support layers (fig. 1).

17. With respect to claims 20-22 and 25-32, see the previous rejections for claims 6, 6, 4, and 7-14 respectively.

18. With respect to claims 36, 37, and 43-50, Noda not only taught the use of high purity zirconia and yttria for the electrolyte (see rejection for claim 1), but also taught the use of high purity alumina as well (paragraph 0016-0018). With respect to the claimed resistivity of the

Art Unit: 1753

electrode, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize said low resistivity in order to increase the signal to noise for the sensor.

19. With respect to claims 51-54 (those limitations not covered above), the use of a mixture of yttria stabilized cubic phase and yttria stabilized monoclinic phase of Sugiyama (col. 2, lines 24-34) reads on the terms “yttria stabilized zirconia” and “monoclinic zirconia” respectively.

20. Claims 2, 3, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama in view of Noda as applied to claims 1 and 22 above, and further in view of Aizawa et al (USP 5,968,673).

21. The references set forth all the limitations of the claims, but did not explicitly set forth the presence of a dispersant in the mixture. Aizawa teaches in an alternate solid electrolyte construction that adding a dispersant to a ceramic mixture (i.e. slurry) improves the dispersion of the particles in the slurry allowing for a more homogeneous mixture (col. 4, lines 20-27). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of a dispersant in order to create a homogeneous mixture of the electrolyte particles. With respect to the concentration of monoclinic zirconia in the zirconia-alumina, see the rejection for claim 6 above. With respect to the particular composition of the dispersant, Aizawa teaches the use of a phosphate ester (col. 4, lines 26 and 27).

22. Claims 5 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama in view of Noda as applied to claims 1 and 22 above, and further in view of Wang (USP 4,897,174).

Art Unit: 1753

23. The references set forth all the limitations of the claims, but did not explicitly recite the step of de-airing the mixture. Wang teaches in an alternate electrochemical sensor construction that exposing a ceramic mixture (i.e. a slurry) to a vacuum (i.e. de-airing) ensures that the slurry possesses no trapped air (col. 3, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Wang for the method of Sugiyama and Noda in order to ensure that there is no trapped air in the mixture.

24. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama in view of Friese as applied to claim 18 above, and further in view of Lankheet (USP 6,346,178).

25. The references set forth all the limitations of the claim, but did not explicitly recite the presence of a ground plane between the heater and the alumina body. Lankheet teaches in an alternate electrochemical sensor that the inclusion of a ground plane 42 can prevent the premature failure of the heater (col. 4, lines 52-64). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Lankheet for the method of Sugiyama and Noda in order to prevent the premature failure of the heater.

Allowable Subject Matter

26. Claims 38-42 are allowed.

27. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose nor render obvious the method of manufacturing a zirconia-alumina body comprising all the limitations of claims 38 and 42 in their entirety with particular

Art Unit: 1753

attention to the mixing a yttria stabilized zirconia, yttria, and alumina combined with the depositing of the mixture unto an unfired alumina body.

Response to Arguments

28. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (703) 305-0506. The examiner can normally be reached on Monday through Thursday from 7:00 AM-4:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Mr. Nam Nguyen, can be reached at (703) 308-3322.

When filing a fax in Group 1700, please indicate in the header "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of this application. This will expedite processing of your papers. The fax number for regular communications is (703) 305-3599 and the fax number for after-final communications is (703) 305-5408.

Art Unit: 1753

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

A handwritten signature in black ink, appearing to read 'Kaj K. Olsen', with a stylized flourish extending from the end.

Kaj K. Olsen
Patent Examiner
AU 1753
October 15, 2003